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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,416	03/30/2004	Tetsuzo Ueda	43890-673	1264

7590 09/02/2008

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EXAMINER	
ARENA, ANDREW OWENS	

ART UNIT	PAPER NUMBER
2811	

MAIL DATE	DELIVERY MODE
09/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,416	UEDA ET AL.	
	Examiner	Art Unit	
	Andrew O. Arena	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,5 and 51-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,5 and 51-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

The arguments filed 5/12/2008 were fully considered but are not persuasive.

The argument that "Inoguchi also fails to disclose…a seed layer" is not convincing since the term "seed" must be interpreted per MPEP § 2111 and reads on at least one of the several layers disclosed by Inoguchi.

The only feature of the claimed invention that is arguably missing from Inoguchi is an explicit teaching that said epitaxial layers are of the 4H-type, the advantages of which are taught by Onojima.

Claim Rejections - 35 USC § 103

Claims 2, 3, 5 and 51-59 are rejected under 35 U.S.C. 103(a) as being obvious in view of Inoguchi (US 5,900,647) and Onojima (Appl. Phys. Lett., V.83, N.25, pg 5208).

RE claim 51, Inoguchi discloses an optoelectronic device (Fig 4, col 8 ln 28-33; Fig 6, col 11 ln 60-65) comprising,

a first III-V Nitride semiconductor epitaxial film (83) formed in contact with a substrate (21/22, 81/82) having 4H-type structure (col 10 ln 36-38), wherein said first III-V Nitride semiconductor epitaxial film is a AlN film (col 12 ln 29-30), and

a seed layer (84) of III-V Nitride (GaN: col 12 ln 33) selectively formed on said first III-V Nitride semiconductor epitaxial film, wherein said seed layer contains Ga, and

a second III-V Nitride semiconductor epitaxial film (23-26, col 8; 85-88, col 12) formed on said first III-V Nitride semiconductor epitaxial film, wherein said second III-V Nitride semiconductor epitaxial film contains Ga and is in contact with said seed layer.

Inoguchi differs from the claimed invention only in not expressly disclosing the polytype of said III-V Nitride films.

Onojima teaches that high-performance devices may be realized with 4H-AlN on 4H-SiC substrates (e.g., pg 5210 col 2 ln 13-16) and further teaches such arrangements are desirable in the art due to certain appreciated advantages (pg 5208 col 1 ln 1-4).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that said III-V Nitride films are 4H films; at least for the advantages of such arrangement. Also see MPEP § 2144.06-2144.07.

RE claim 2, Inoguchi discloses the substrate is silicon carbide (col 8 ln 38).

RE claim 3, the combined teachings relied upon disclose said III-V Nitride semiconductor epitaxial film is formed in contact with a substrate having (11-20) face (Onojima: pg 5210 col 2 ln 3).

RE claim 5, Inoguchi discloses a number of group III atoms are equal to a number of nitrogen atoms on a surface of said III-V Nitride semiconductor epitaxial film. Inoguchi discloses same composition; claimed property inherent. MPEP § 2112.01(II).

RE claim 52, Inoguchi discloses an optoelectronic device (Fig 4, col 8 ln 28-33) comprising,

a first III-V Nitride semiconductor epitaxial film (83) selectively formed in contact with a substrate (21/22, 81/82) having 4H-type structure (col 10 ln 36-38);

a seed layer (84) of III-V Nitride (GaN: col 12 ln 33) selectively formed on said first III-V Nitride semiconductor epitaxial film,

a second III-V Nitride semiconductor epitaxial film (23-26, col 8 ln 53-58; 85-88, col 12) formed on said first III-V Nitride semiconductor epitaxial film; and

a waveguide (31; col 9 ln 44, col 8 ln 20, 111) formed on said second III-V Nitride semiconductor epitaxial film,

wherein said first III-V Nitride semiconductor film is an AlN film (col 12 ln 29),

said seed layer contains Ga (col 12 ln 33),

said second III-V Nitride semiconductor film contains Ga and is in contact with said seed layer, and

said second III-V Nitride semiconductor epitaxial film includes an n-type layer (23, col 8 ln 59; 87/88, col 12 ln 51-58) , a p-type layer (26, col 9 ln 10; 84/85, col 12 lns 33 & 66) and an active layer (25, col 9 ln 4-5; 86, col 12 ln 43-46), said active layer being formed between said n-type layer and said p-type layer.

Inoguchi differs from the claimed invention only in not expressly disclosing the polytype of said III-V Nitride semiconductor epitaxial films.

Onojima teaches that high-performance devices may be realized with 4H-AlN on 4H-SiC substrates (e.g., pg 5210 col 2 ln 13-16) and further teaches such arrangements are desirable in the art due to certain appreciated advantages (pg 5208 col 1 ln 1-4).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that said III-V Nitride semiconductor epitaxial films are 4H films; at least for the advantages of such arrangement. Also MPEP § 2144.06-2144.07.

RE claim 53, Inoguchi discloses a plurality of layers (23-26) are disposed between said waveguide (31) and said substrate (21).

RE claim 54, Inoguchi discloses said substrate having 4H [poly]type structure is SiC (col 10 ln 36-38).

RE claim 55, the combined teachings relied upon disclose said III-V Nitride semiconductor epitaxial film is formed in contact with a substrate having (11-20) face (Onojima: pg 5210 col 2 ln 3).

RE claim 56, the combined teachings relied upon disclose a number of group III atoms are equal to a number of nitrogen atoms on a surface of said III-V Nitride semiconductor epitaxial film. Onojima discloses same composition; claimed property inherent. MPEP § 2112.01(II).

RE claim 57, the combined teachings relied upon disclose said waveguide is formed as a straight line perpendicular to either (0001) face or (1-100) face (Inoguchi Fig 4 shows said stripe is perpendicular to the substrate face; the combination discloses the substrate face is (11-20), so the stripe must be perpendicular to either claimed face, since they are the two remaining axes, e.g. Onojima Fig 3 or applicant's Fig 2-4).

RE claims 58 & 59, Inoguchi discloses all the structure implied by the process recitations of these claims. See MPEP § 2113.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is (571)272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571- 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. For more info about PAIR, see http://pair-direct.uspto.gov. For questions PAIR access, contact the Electronic Business Center at 866-217-9197 (toll-free). For assistance from a USPTO Customer Service Rep or access to the automated info system, call 800-786-9199 or 571-272-1000.

/Andrew O. Arena/
Examiner, Art Unit 2811
2 September 2008

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811